Structure elucidation of antidiabetic compound of ethyl acetate extract of pandan wangi (Pandanus amaryllifolius Roxb.) leaves

Dede Sukandar*, La Ode Sumarlin, Hilyatuz Zahroh, Eka Rizki Amelia

Program Studi Kimia dan Fakultas Sains dan Teknologi UIN Syarif Hidayatullah
Jakarta, Jalan Ir. H. Juanda No 95 Ciputat 15412 Indonesia
*Corresponding author: d_sukandar@hotmail.com

Abstract

Ethyl acetate extract of pandan wangi leaves (P. amaryllifolius Roxb.) was reported to have antidiabetic activity with IC₅₀ value equals to 94.23 ppm. This research performed isolation and structure determination of ethyl acetate extract of pandan wangi leaves. This research was conducted using preparative TLC, UV-VIS and FTIR spectroscopy analysis. Preparative TLC using n-hexane:ethyl acetate (3:1) eluent, Ce₂(SO₄)₃ and Lieberman-Burchard reagents showed the presence of steroids (Rf=0,2; 0,3; 0,55; 0,60; 0,70). UV-VIS analysis showed the absorbance at λ=280 nm, while FTIR analysis showed vibration at wavenumber 3426,29 cm⁻¹(OH), 2926,18 cm⁻¹(CH alifatik) and 1637,44 cm⁻¹(C=C). Based on these results, it is suspected that the compound with antidiabetic activity from ethyl acetate extract is steroid.

Keyword: Ethyl acetate extract, pandan wangi (P. amaryllifolius Roxb.), preparative TLC, UV-VIS and FTIR spectroscopy.

Introduction

Tropical forest plants of Indonesia have important role just like other natural resources such as gasses, coal and minerals. Plant resources are an abundant source of chemical compounds that can be used in medicines, insecticide and cosmetics (Lenny, 2006).

Most traditional treatments use ingredients from plant resources, such as roots, barks, woods, leaves, flowers and seeds. One of the plants often used as traditional medicine ingredient is (Pandanus amaryllifolius Roxb.). Pandan wangi leaves are known for creating glossy hair; preventing hair fall, neural weakness, loss of appetite, rheumatic and stiff. It is also a food additive acts as flavoring, deodorizer and staining agent to food (Dalimartha, 2002).

Figure 1 Pandan Wangi Plant (P. amaryllifolius Roxb.)

Pandan wangi leaves contain alkaloids, saponins, flavonoids, tannins, polyphenols, and dye (Sugati and Jhonny, 1991). The main composition that responsible for its smell is not known for sure. It is possible that the major compound of aroma constituent in pandan wangi leaves is 2-acetyl-1-pyrroline (2AP) (Buttery, 1983).

Sukandar, et.al. (2008 reported that the distillate of pandan wangi leave can control the pest infestation on rice (Sitophylus oyzae L.) with 9.42% percent rejection at concentrations of 10%, while ethyl acetate extract of this plant leaves is also toxic to Artemia salina Leach. with toxicity (LC₅₀) of 288.4 ppm, hence it is potential as anticancer agent.

It was reported that ethyl acetate extract of pandan wangi leaves has antidiabetic activity with inhibitory concentration (IC₅₀) 94.23ppm. Compounds thought to have antidiabetic activity are steroids (Sukandar, et.al., 2009). Therefore, in this study we intend to perform the isolation and structure determination of antidiabetic compounds from ethyl acetate extract of pandan wangi leaves (P.amaryllifolius Roxb.) Hence it can be used as alternative medicines for diabetic mellitus patients.

Methods

Extraction was performed by mean of maceration for 3 x 24 hours, filtered and concentrated with a Buchi rotary evaporator (65 °C, 60 rpm). While antidiabetic activity assay of ethyl acetate extract of pandan wangi leaves fragrant was conducted using p-nitrofenil α-glukopiranosida(PNP-α-glukopiranosida) method, chemical component analysis was conducted using Shimadzu QP-2010 GC-MS chromatography, thin-layer chromatography (TLC) analysis was conducted using Si gel PF₂₅₄ with 0.5 mm aluminum plate and was eluted...